APPENDIX I

Trip Report by Mrs. Swann Lake, CEWES

1. OBJECTIVES OF TRIP: I was requested by the USEPA Environmental Research Laboratory (ERL), Athens, Georgia, to travel to Spain to provide assistance on reservoir water quality modeling. The ERL has a cooperative project with Communidad de Madrid, which is applying the reservoir water quality model, CE-QUAL-R1, to several of their water supply reservoirs. This model was developed and is maintained by the Water Quality Modeling Group, Environmental Laboratory of WES. Personnel of Communidad de Madrid are using the model to evaluate impacts of future development in the drainage basin and various reservoir water quality management strategies. Spain relies on surface water reservoirs for water supply, as the region is arid. Therefore, the water quality of these reservoirs is extremely important. My objective was to provide (through the EPA project) assistance on the implementation of this model. EPA personnel were providing similar assistance with the watershed (HSPF) and strea (QUAL2E) water quality models.

2. PLACE(S) AND DATE(S) VISITED: Madrid and nearby reservoirs, 14-19 May 1988; Saville and nearby reservoirs, 19-20 May 1988.

3. SUBJECTS DISCUSSED: CE-QUAL-R1 input requirements, output interpretation, model conversion problems, selection of model parameters, and application procedures. Discussed specifics of reservoirs to be modeled and their water quality problems. Also discussed alternatives for water quality improvement.

4. FOREIGN/US OFFICIALS PRESENT: There were three USEPA personnel and one EPA contractor, in addition to myself. We worked with five representatives from Spain. Our primary contact was Francisco Cubillo of Communidad de Madrid. Mr. Tom Barnwell of EPA is the project manager for the U.S. team.

5. GIFTS RECEIVED: None.

6. COMMITMENTS RECEIVED OR GIVEN: None.

7. PERCEPTIONS/CONCLUSIONS: The Spanish water resources agencies can benefit from our assistance, not only in modeling, but in reservoir management as well. They have some capable personnel, thus there is a high potential for success in applying these models. However, the degree of success may depend on the opportunities for us to provide future assistance. Future assistance may be limited because the project that funded the present cooperation concludes in one year. They need to study a number of reservoirs with serious water quality problems. Data collected required to support modeling just began, so they have years of work to do. It appears that several of the reservoirs could be Improved with engineering enhancement techniques, such

as reservoir destratification. Additionally, site preparation techniques for new reservoir sites may be of interest. The CE has a lot to offer on the subject of reservoir water quality. Likewise, we could gain new insights through future assistance on Spain*s reservoir water quality problems studies. We have technology they need, and they have the problem that we could learn from if we were to help solve them. The EPA project was funded through the U.S.-Spain Committee for Scientific and Technological Cooperation.

9. TOTAL ESTIMATED EXPENSES:

Item	Total Expenditures
Lodging and Meals	$1200
Air Fare	880
Transportation in Country	190
Other Expenses	None

ALL EXPENSES WERE PAID BY EPA ON EPA TRAVEL ORDERS.

10. QUANTITATIVE BENEFITS: During the trip, I was providing assistance to modelers in Spain, so they benefited rather than us. Learning of their problems did give me a broader perspective of reservoirs and the associated problems/needs.

11. VALUE OF FUTURE PARTICIPATION: Spain is just embarking on their reservoir water quality studies. If we could assist in these studies, we would benefit from the participation and share in the lessons learned.

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